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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,160	10/08/2003	John W. Ketchum	030440	8210

23696 7590 08/20/2008
QUALCOMM INCORPORATED
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121

EXAMINER	
WONG, LINDA	
ART UNIT	**PAPER NUMBER**
2611	

NOTIFICATION DATE	DELIVERY MODE
08/20/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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kascanla@qualcomm.com
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Response to Arguments

1. Applicant's arguments filed 8/4/2008 have been fully considered but they are not persuasive.

   a. Regarding **claim 1**, the applicant contends

> “Independent claim 1 is directed to a method of performing spatial processing at a receiver in a wireless multiple-input multiple-output (MIMO) communication system. The method comprises obtaining a plurality of received symbol streams for a plurality of data symbol streams sent via a plurality of spatial channels of a MIMO channel in the wireless MIMO communication system. Spatial processing is performed at a transmitter with steering vectors, which are estimates of transmitter steering vectors required to orthogonalize the plurality of spatial channels. The method further comprises receiving orthogonal pilot transmissions from a plurality of antennas at the transmitter, and obtaining an estimate of a channel response matrix for the MIMO channel, wherein the estimated channel response matrix is obtained based on the received orthogonal pilot transmissions. The method further comprises performing spatial processing on the plurality of received symbol streams with a spatial filter to obtain a plurality of filtered symbol streams, which are estimates of the plurality of data symbol streams. The spatial filter has a response derived based on a minimum mean square error (MMSE) criterion that minimizes mean square error between the plurality of filtered symbol streams and the plurality of data symbol streams”.

The examiner respectfully disagrees. Paragraph 32 discloses OFDM systems. Such a system would have "different sub-streams" with "different carrier frequencies" used for transmission, wherein the "spacing of which are such that they are orthogonal and can be distinguished at the receiver." Paragraph 32 further discloses "The coefficients for the equations are the complex channel transfer coefficients between the n_T transmitter antennas and the n_R receiver antennas, described by a transfer function H (discussed below)". Paragraph 56 further discloses “One further step is the transmission of training sequences in the frame of bits, which are needed by the receiver in order to extract the sub-streams. There are two types of training sequences needed by the receiver; one to enable a measurement of the angular spectrum A(W) and one for determination of the transfer matrix H." As indicated in paragraph 32, the system can be OFDM, wherein within an OFDM system, pilot or training sequences as disclosed in paragraph 56 would be received so to be used to determine the transfer matrix, H. As per the final rejection mailed 6/2/2008, the steering vector is produce based on the received training sequences, which would be orthogonal within the OFDM system. For further description, please refer to the rejection of claims 1,11, and 15 as stated in the final rejection mailed 6/2/2008.

b. Regarding **claim 19**, the applicant contends

> “Independent claim 19 is directed to a method of performing spatial processing at a transmitter in a wireless multiple-input multiple-output (MIMO) communication system. The method comprises obtaining a plurality of data symbol streams for transmission on a plurality of spatial channels of a MIMO channel in the wireless MIMO communication system, and obtaining an estimate of a plurality of steering vectors, wherein the plurality of steering vectors is based on received orthogonal pilot transmissions. The method further comprises performing spatial processing on the plurality of data symbol streams with the plurality of steering vectors, one steering vector for each data symbol stream, to obtain a plurality of transmit symbol streams for transmission from a plurality of transmit antennas. The plurality of steering vectors are estimates of transmitter steering vectors required to orthogonalize the plurality of spatial channels. The plurality of data symbol streams are recovered at a receiver with a spatial filter having a response derived based on a minimum mean square error (MMSE) criterion that minimizes mean square error between a plurality of filtered symbol streams from the spatial filter and the plurality of data symbol streams.
>
> The applied references are not seen to disclose or suggest the features of the claimed invention, particularly with respect to at least the features of (1) receiving orthogonal pilot transmissions from a plurality of antennas at the transmitter, and obtaining an estimate of a channel response matrix for the MIMO channel, wherein the estimated channel response matrix is obtained based on the received orthogonal pilot transmissions (as in claim 1), and (2) obtaining an estimate of a plurality of steering vectors, wherein the plurality of steering vectors is based on received orthogonal pilot transmissions (as in claim 19)”.

The examiner respectfully disagrees. The applicant contends the same limitations as discussed in the remarks for claim 11. Please refer to the rebuttal of claim 11.

c. Regarding **claims 11,15,26,30,** the applicant contends

> "Independent claims 11, 15, 26 and 30 recite features similar to those in claims 1 and 19 discussed in greater detail above. Accordingly, these claims are believed to be allowable over the applied references for at least the same reasons as claims 1 and 19. The other claims currently under consideration in the application are dependent from the independent claims discussed above and therefore are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested."

The examiner respectfully disagrees. The applicant contends the same limitations as disclosed in the remarks for claims 11 and 19. Please refer to the rebuttal of claim 11.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA WONG whose telephone number is (571)272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Linda Wong
8/12/2008

/Kevin M. Burd/
Primary Examiner, Art Unit 2611
8/14/2008